AZ CC1 Q1 Test 3 Review Key

1) $32^x = 8$

$(2^5)^x = 2^3$

$\frac{5x}{5} = \frac{3}{5}$

$x = \frac{3}{5}$

2) $(6+9i)-(-4-2i) = \boxed{10+11i}$

$6-(-4) = 10$

$9i-(-2i) = 11i$

3) $(-3+6i)(3+5i)$ $\quad i^2 = -1$

$-9-15i+18i+30i^2$

$-9+3i-30$

$-39+3i$

4) $4y^{\frac{2}{3}} - 5 = 20$

$+5 \quad +5$

$\frac{4y^{\frac{2}{3}}}{4} = \frac{25}{4}$

$y^{\frac{2}{3}\left(\frac{3}{2}\right)} = \left(\frac{25}{4}\right)^{3/2}$

$\boxed{y = \frac{125}{8}}$

5) $2\sqrt{-196} - 3\sqrt{-225}$

$2i\sqrt{196} - 3i\sqrt{225}$

$2i(14) - 3i(15)$

$28i - 45i$

$\boxed{-17i}$

6) i^{2001} $\quad \frac{2001}{4} = 500.\underline{25}$

$i^{2001} = i^1 = \boxed{i}$

7) $\left(\frac{1}{3}\right)^{1-x} = 9$

$\left(\frac{3}{1}\right)^{-1(1-x)} = 3^2$

$3^{-1+x} = 3^2$

$-1+x = 2$

$+1 \quad +1$

$\boxed{x = 3}$

8) $a^{-\frac{2}{5}} = \frac{1}{a^{2/5}} = \boxed{\frac{1}{\sqrt[5]{a^2}}}$

9) $\sqrt{90} + \sqrt{40}$

$\sqrt{9}\sqrt{10} \quad \sqrt{4}\sqrt{10}$

$3\sqrt{10} + 2\sqrt{10}$

$\boxed{5\sqrt{10}}$

10) $\sqrt{98} - 2\sqrt{18}$

$\sqrt{49}\sqrt{2} - 2\sqrt{9}\sqrt{2}$

$7\sqrt{2} - 2 \cdot 3\sqrt{2}$

$7\sqrt{2} - 6\sqrt{2}$

$\boxed{1\sqrt{2}}$

11) $2\sqrt{5} \cdot \sqrt{15}$

$2\sqrt{75}$

$2\sqrt{25}\sqrt{3}$

$2 \cdot 5\sqrt{3}$

$\boxed{10\sqrt{3}}$

12) $\frac{6\sqrt{60}}{24\sqrt{3}} = \frac{\sqrt{20}}{4} = \frac{\sqrt{4}\sqrt{5}}{4} = \frac{2\sqrt{5}}{4} = \boxed{\frac{\sqrt{5}}{2}}$

13) $\sqrt{3}\left(2\sqrt{27} - \sqrt{6}\right)$

$2\sqrt{81} - \sqrt{18}$

$2 \cdot 9 - \sqrt{9}\sqrt{2}$

$\boxed{18 - 3\sqrt{2}}$

14) $(2+\sqrt{5})(3-\sqrt{5})$

$6 - 2\sqrt{5} + 3\sqrt{5} - \sqrt{25}$

$6 + \sqrt{5} - 5$

$\boxed{1 + \sqrt{5}}$

15) $(12x^4y^2)^2\left(\frac{x^5y}{2}\right) = (12x^4y^2)(12x^4y^2)\left(\frac{x^5y}{2}\right) = \frac{144x^{13}y^5}{2} = \boxed{72x^{13}y^5}$

16) $(r5)^3(25)^{-2}(4r)^4$

$(r^3 5^3)\left(\frac{1}{2^2 5^2}\right)(4^4 r^4) = \frac{r^7 5^3 256}{4 5^2} = \boxed{64r^7 5}$

17) $\frac{a^{-3}b^4}{a^{-5}b^5} = \boxed{\frac{a^8}{b}}$

18) $(-32)^{\frac{2}{5}} = (-2)^2 = \boxed{4}$

19) $\left(\frac{25}{64}\right)^{-\frac{3}{2}} = \left(\frac{64}{25}\right)^{\frac{3}{2}} = \left(\frac{8}{5}\right)^3 = \boxed{\frac{512}{125}}$

rationalize ↓

20) $\frac{\sqrt{2a^3b}}{\sqrt{6a}} = \frac{\sqrt{a^2b}}{\sqrt{3}} = \frac{a\sqrt{b}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \boxed{\frac{a\sqrt{3b}}{3}}$

21) $2\sqrt{8x^3} + 3x\sqrt{32x} - x\sqrt{18x}$

$2\sqrt{4x^2}\sqrt{2x} \quad 3x\sqrt{16}\sqrt{2x} \quad -x\sqrt{9}\sqrt{2x}$

$2 \cdot 2x\sqrt{2x} \quad 3x \cdot 4\sqrt{2x} \quad x \cdot 3\sqrt{2x}$

$4x\sqrt{2x} + 12x\sqrt{2x} - 3x\sqrt{2x} = \boxed{13x\sqrt{2x}}$

22) $4x^{1/2} = \boxed{4\sqrt{x}}$ 23) $\sqrt[4]{3x} = \boxed{(3x)^{1/4}}$

24) $(w+1)^{\frac{3}{2}\left(\frac{2}{3}\right)} = 64^{\frac{2}{3}}$

$w+1 = 16$

$-1 \quad -1$

$\boxed{w = 15}$

25) $\frac{2x^{2/5}}{2} = \frac{32}{2}$

$x^{\frac{2}{5}\left(\frac{5}{2}\right)} = 16^{\frac{5}{2}}$

$\boxed{x = 1024}$

26) $3y^{1/3} - 2 = 4$

$+2 \quad +2$

$\frac{3y^{1/3}}{3} = \frac{6}{3}$

$y^{\frac{1}{3}\left(\frac{3}{1}\right)} = 2^{\frac{3}{1}}$

$\boxed{y = 8}$

27) $16^{x-1} = 8^{x}$

$(2^4)^{x-1} = (2^3)^{x}$

$4x - 4 = 3x$

$-4x \quad -4x$

$-4 = -1x$

$\boxed{4 = x}$

28) $81^{x+2} = 27^{5x+4}$

$(3^4)^{x+2} = (3^3)^{5x+4}$

$4x + 8 = 15x + 12$

$-4x \quad -4x$

$8 = 11x + 12$

$-12 \quad -12$

$\frac{-4}{11} = \frac{11x}{11}$

$\boxed{x = \frac{-4}{11}}$

29) $2^{x+1} = 8$

$2^{x+1} = 2^3$

$x + 1 = 3$

$-1 \quad -1$

$\boxed{x = 2}$